

## P R O P. I.

*Those superficies of transparent Bodies reflect the greatest quantity of Light, which have the greatest refracting power; that is, which intercede mediums that differ most in their refractive densities. And in the confines of equally refracting mediums there is no reflexion.*

The Analogy between reflexion and refraction will appear by considering, that when Light passeth obliquely out of one medium into another which refracts from the perpendicular, the greater is difference of their refractive density, the less obliquity is requisite to cause a total reflexion. For as the Sines are which measure the refraction, so is the Sine of incidence at which the total reflexion begins, to the radius of the Circle, and consequently that incidence is least where there is the greatest difference of the Sines. Thus in the passing of Light out of Water into Air, where the refraction is measured by the Ratio of the Sines 3 to 4, the total reflexion begins when the Angle of incidence is about 48 degrees 35 minutes. In passing out of Glass into Air, where the refraction is measured by the Ratio of the Sines 20 to 31, the total reflexion begins when the Angle of incidence is 40 deg. 10 min. and so in passing out of crystal, or more strongly refracting mediums into Air, there is still a less obliquity requisite to cause a total reflexion. Superficies therefore which refract most do soonest reflect all the Light which is incident on them, and so must be allowed most strongly reflexive.

But

But the truth by observing, that transparent mediums, as common-Glass, Crystal, white transparent wax, &c. whose reflexion is stronger than that of the superficies hath a greater reflexion at the confine of Air than at the confine of Air and water, or at the confine of Air and oil, or in the confine of such like transparent mediums, where reflexion becomes weaker if they be more strongly refracting Liquors, as of Turpentine. If by any imaginary partition of those two parts of water and Ice 'tis very manifest that something greater is reflected, and in the same manner other denser substances, where the mediums differ more. Hence in the confine of Air and water there ought to be a total reflexion in the confine of Air and oil, though I have not observed it. In two Glasses of equal density, where reflexion, as was shewn, is the same may be observed, as in dividing two Crystals, or in the circumstances in which no